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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/817,004

04/05/2004

Naoki Yamamoto

HITA.0536

1599

7590

11/16/2005

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EXAMINER

SEFER, AHMED N

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/817,004

Applicant(s)

YAMAMOTO ET AL.

Examiner

A. Sefer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 and 21-26 is/are pending in the application.
- 4a) Of the above claim(s) 1-5, 8-10 and 21-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6 and 7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/5/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 1-5, 8-10 and 21-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species. Election was made **without** traverse in the reply filed on 9/2/2005.

### ***Double Patenting***

2. Applicant is advised that should claim 10 be found allowable, claim 25 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "said first nitride film ...." There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 6 and 7, as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Nakajima et al. (“Nakajima”) USPN 5,907,188.

Nakajima discloses in fig. 31I a semiconductor integrated circuit device comprising: a first conductive region 722 and a second conductive region 722' formed on a semiconductor substrate and separated by an isolation region 703; a gate insulator 706 formed on said first conductive region and second conductive region across said isolation region; a second conductive silicon layer 723 which is deposited on said first conductive region, and a first conductive silicon layer 723 which is deposited on said second conductive region, and formed on said gate insulator having a boundary on said isolation region; and carbon (col. 32, lines 51-67) which is included in said first nitride film of refractory metal and first refractory metal film on a boundary between said first conductive and second conductive silicon layers in a gate electrode structure consisting of a first nitride film of refractory formed on said first conductive and second conductive silicon layers and a first refractory metal film formed on said first nitride film of refractory metal.

Regarding claim 7, Nakajima discloses instead of carbon, nitrogen and oxygen elements are included in said first nitride film of refractory metal and first refractory metal film on a boundary between said first conductive and second conductive silicon layers.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6 and 7, as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. ("Nakamura") USPN 6,329,681 in view of Agarwal ("Agarwal") USPN 6,875,679.

Nakamura discloses in fig. 4 a semiconductor integrated circuit device comprising: a first conductive region 2 and a second conductive region 3 formed on a semiconductor substrate and separated by an isolation region 7; a gate insulator 6 formed on said first conductive region and second conductive region across said isolation region; a second conductive silicon layer 11a which is deposited on said first conductive region, and a first conductive silicon layer 11a which is deposited on said second conductive region, and formed on said gate insulator having a boundary on said isolation region; and first nitride film of refractory metal and first refractory metal film 11b on a boundary between said first conductive and second conductive silicon layers in a gate electrode structure consisting of a first nitride film of refractory formed on said first conductive and second conductive silicon layers and a first refractory metal film 11c formed on said first nitride film of refractory metal, but lacks anticipation of carbon included in said first nitride film of refractory metal and first refractory metal film on a boundary between said first conductive and second conductive silicon layers in a gate electrode structure consisting of a first nitride film of refractory formed on said first conductive and second

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conductive silicon layers and a first refractory metal film formed on said first nitride film of refractory metal.

Agarwal discloses in fig. 10 a semiconductor integrated circuit device comprising: a conductive region 102; a gate insulator 106 formed on said conductive region; a conductive silicon layer 108 deposited on said conductive region; a carbon 122 which is included in said first nitride film of refractory metal 110 and first refractory metal film 112 in a gate electrode structure consisting of a first nitride film of refractory formed on said conductive silicon layer and a first refractory metal film formed on said first nitride film of refractory metal.

Therefore, it would have obvious to one skilled in the art at the time the invention was made to modify Nakamura's device by incorporating a carbon which is included in said first nitride film of refractory metal and first refractory metal film since that would prevent degradation of the device as taught by Agarwal.

Regarding claim 7, Agarwal discloses (col. 2, lines 62-67) instead of carbon, nitrogen and oxygen elements are included in said first nitride film of refractory metal and first refractory metal film on a boundary between said first conductive and second conductive silicon layers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921.

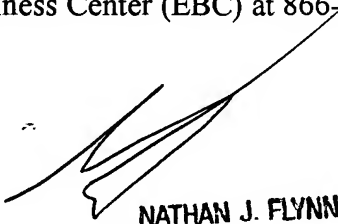
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANS

November 2, 2005



**NATHAN J. FLYNN**  
SUPERVISORY PATENT EXAMINER  
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